

We claim:

1. An expression cassette comprising
  - a) the coding nucleic acid sequence for 4-hydroxyphenylpyruvate dioxygenase (HPPD) or for a functional equivalent thereof; and/or
  - b) at least one nucleic acid sequence (anti-HGD) which is capable of inhibiting the homogentisate dioxygenase (HGD) activity
- under the genetic control of regulatory nucleic acid sequences.
2. An expression cassette as claimed in claim 1, wherein the anti-HGD sequence is transcribable into an antisense nucleic acid sequence which is capable of inhibiting the HGD activity.
3. An expression cassette as claimed in claim 1 or 2, wherein the coding HPPD sequence is linked functionally to the coding sequence of a plant-organelle-specific transit peptide.
4. An expression cassette as claimed in any of the preceding claims, wherein the coding HPPD sequence and the anti-HGD sequence are in each case under the genetic control of a plant-specific promoter.
5. An expression cassette as claimed in any of the preceding claims, wherein the coding HPPD nucleic acid sequence encodes a protein containing an amino acid sequence in accordance with SEQ ID NO:15 or a functional equivalent thereof or encompasses a nucleic acid sequence from residue 8 to residue 1153 in accordance with SEQ ID NO:14 or a functional equivalent thereof.
6. An expression cassette as claimed in any of the preceding claims, which encompasses an HGD sequence motif in accordance with SEQ ID NO:1 in antisense orientation.
7. A recombinant vector encompassing at least one expression cassette as claimed in any of claims 1 to 6.

8. A vector as claimed in claim 7 encompassing at least one expression construct of the type:

5'-plant-specific-promoter/HPPD or anti-HGD/terminator-3',

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where the individual elements are functionally linked to each other and where HPPD optionally encodes a fusion protein encompassing a transit peptide which can be eliminated and a polypeptide with HPPD activity.

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9. A vector as claimed in claim 8 encompassing one of the following expression constructs:

15 a) 35S promoter/anti-HGD/OCS terminator

b) legumin B promoter/HPPD/NOS terminator

20 c) 35S promoter/anti-HGD/OCS terminator/legumin B promoter/HPPD/NOS terminator

10. A microorganism comprising a recombinant vector as claimed in any of claims 7 to 9.

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11. A microorganism as claimed in claim 10 from the genus *Agrobacterium* and in particular the species *Agrobacterium tumefaciens*.

- 30 12. The use of a vector as claimed in any of claims 7 to 9 or of a microorganism as claimed in claim 10 or 11 for the transformation of plants, plant cells, plant tissue or plant organs.

- 35 13. The use as claimed in claim 12, wherein the plants, plant cells, plant tissue or plant organs are made capable of an improved tocopherol synthesis.

- 40 14. A transgenic plant, transformed with a vector as claimed in any of claims 7 to 9 or with a microorganism as claimed in claim 10 or 11, or transgenic cells, tissue, organs or transgenic propagation material thereof.

- 45 15. A transgenic plant as claimed in claim 14 selected from amongst crop plants such as cereals, maize, soybeans, rice, cotton, sugar beet, canola, sunflowers, flax, potatoes,

tobacco, tomatoes, oilseed rape, alfalfa, salad species such as cress, and the various tree, nut and grapevine species.

- 5 16. A method for generating transgenic plants as claimed in claim 14 or 15, wherein plant cells, tissue or organs or protoplasts are transformed with a vector as claimed in any of claims 7 to 9 or with a microorganism as claimed in claim 10 or 11, the transformed cells, tissue, plant organs or protoplasts are cultured in a growth medium, and, if  
10 appropriate, plants are regenerated from the culture.
17. The use of an expression cassette as claimed in any of claims 1 to 6, a vector as claimed in any of claims 7 to 9, a  
15 microorganism as claimed in claim 10 or 11 or a transgenic plant as claimed in claim 14 or 15 for obtaining plant metabolites, in particular tocopherols.
18. A process for the preparation of tocopherols, which comprises  
20 isolating the tocopherol from a culture of a transformed plant as claimed in claim 14 or 15.

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